Maxxam Analytics Inc

SUBMISSION CASE NARRATIVE
NDMA

MAXXAM L.I.M.S. No. A203768

PROJECT: Applied P & Ch Laboratory NDMA Analysis

I. Receipt

Samples were received at Maxxam on February 8, 2002.
Samples were received in good condition.

II. Holding Times

A. Sample preparation: all holding times were met.
B. Sample analysis: all holding times were met.

III. Method

The method followed was Maxxam's in-house method for NDMA analysis, Entitled "EXTRACTION & ANALYSIS OF NITROSAMINES AND NDMA BY HRMS" SOP # TO.1021.04.

IV. Preparation

Sample preparation proceeded normally. Samples were extracted on February 11, 2002.

V. Analysis

Analysis proceeded normally. Samples were analyzed on February 14, 2002.

A. Calibration: All criteria were met.

B. Mass Resolution: All criteria met.

000091

Maxxam Analytics Inc

C. Method Blank: All acceptance criteria were met for method blank.

D. Laboratory Control Spike: A LCS and LCSDUP were analyzed but found to be contaminated. The Method Blank and Samples were not affected, results were reported except for the LSC and LCSDUP as per client agreement.

E. Matrix spike/Matrix spike duplicate: MS and MSD were analyzed with these samples and had a RPD of 12%.

F. Surrogate Standards: All samples and QC samples met surrogate Standard criteria

G. Samples: Sample analysis proceeded normally.

H. Glass blank: All acceptance criteria for glass blank were met.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Maxxam Analytics Inc., both technically and for completeness, except for any conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the HRMS Strategic Business Unit Operational Manager, as verified by the following signature.

AnnMarie Wright, B.Sc.
Laboratory Operations Manager

SUMMARY OF SAMPLES SUBMITTED-NDMA						
(YYYY/MM/DD)						
SOTA SAMPLE NO.	*MAXXAM*	*DATE*	*DATE*	*DATE*	*DATE*	*ASSOCIATED*
	L.I.M.S. ID	*SAMPLED*	*RECEIVED*	*EXTRACTED*	*ANALYZED*	*QC LABEL*
ER-13	A203768-714490	2002/02/05	2002/02/08	2002/02/11	2002/02/14	20020211
MW-4-2	A203768-714491	2002/02/05	2002/02/08	2002/02/11	2002/02/14	20020211
MW-4-2 MS	A203768-714492	2002/02/05	2002/02/08	2002/02/11	2002/02/14	20020211
MW-4-2 MSD	A203768-714493	2002/02/05	2002/02/08	2002/02/11	2002/02/14	20020211

Glossary of Definitions

NDMA	N-Nitrosodimethylamine
OPR	Ongoing Performance & Recovery Standard (Matrix spike)
PAR	Performance & Recovery Standard (Spiking Mixture)
IPR	Initial Performance & Recovery Standard (Matrix spike)
K-D	Kuderna-Danish concentrator; a device used to concentrate the analytes in a solvent
LIMS	Laboratory Information Management System
MISA	Municipal Industrial Strategy for Abatement
EPA	see USEPA
USEPA	United States Environmental Protection Agency
CEPA	Canadian Environmental Protection Agency

amp	ampere
cm	centimetre
g	gram
h	hour
ID	internal diameter
OD	outside diameter
In.	inch
L	litre
M	Molecular ion
min	minute
mL	mililitre
mm	millimetre
m/z	mass-to-charge ratio
N	Normal; gram molecular weight of solute divided by hydrogen equivalent of solute, per litre of solution
mg	milligram 10^{-3}g
µg	microgram 10^{-6}g
ng	nanogram 10^{-9}g
pg	picogram 10^{-12}g
fg	femtogram 10^{-15}g
ppm	parts per million (mg/L, mg/kg)
ppb	parts per billion (µg/L, µg/kg)
ppt	parts per trillion (ng/L, ng/kg)
ppq	parts per quadrillion (pg/L, pg/kg)
v/v	volume per unit volume
w/v	weight per unit volume
DCM	Dichloromethane (Methylene Chloride)
PFK	Perfluorokerosene
HIRES	High Resolution
GC	Gas Chromatography

MS	Mass Spectrometry
HRMS	High Resolution Mass Spectrometry

Acceptance Criteria
: Values used by the laboratory in order to determine that a process is in control.

Accuracy
: It is the degree of agreement of a measured value with the true or expected value of the quantity of concern.

Analyte
: A Nitrosodimethylamine and/or 1,4-Dioxane parameter tested by a method.

Blind Sample
: It is a sample submitted for analysis whose composition is known to the submitter but unknown to the analyst. A blind sample is used to test the proficiency of a measurement process.

Calibration Standard (CAL)
: Consist of a set of solutions containing known amounts of native & carbon-13-labelled NDMA and/or 1,4-Dioxane. These solutions are used to establish the relationship between the parameter's concentration & MS detector response over the expected range of sample concentration.

Calibration Verification Material
: Consists of a calibration standard solution of intermediate level concentration (e.g. CS3), used to assess whether the initial calibration is still valid.

Certified Reference Material
: It is a stable, homogenous, and well characterized reference material, one or more of whose property values are certified by repetitive analysis by several operators & different methodologies in one or more qualified laboratories of known precision & accuracy. This material is used to assess the accuracy of a measurement process.

CAS#
: Chemical Abstracts Compound Registry Number.

Control Sample
: It is a reference material of known composition that is analyzed concurrently with test samples to evaluate the accuracy and/or precision of a measurement process.

EDL
: Estimated detection limit or detection limit.

Glassware Proof Rinse

It is the composite final solvent rinse of each piece of glassware intended for use in processing a batch of samples. Proof rinse samples are analyzed before sample processing begins.

Instrument Detection Limit

It is the smallest concentration/amount of analyte, in a solution containing only the analyte(s) of interest, which produces an instrumental response that satisfies all analyte detection & identification criteria.

IS — Internal Standard, a deuterated or ^{13}C-labelled analyte that is added to a sample extract prior to instrument analysis.

Isomer — A member of a group of compounds that differ from each other only in terms of locations of a specified number of common substituent atoms, or groups of atoms, on the parent compound.

Method Blank — Laboratory control sample using reagents, purified water, soil or relevant matrix known to be free of contaminants.

Method Detection Limit (MDL)

It is the smallest test sample concentration/amount of analyte that produces an instrumental response that satisfies all analyte detection & identification criteria when the sample is processed & analyzed according to the requirements of a specific test method. Reported MDL values reflect the composite effect of sample-related variables as well as method-related variables.

MSDS — Material Safety Data Sheet

NIOSH — National Institute of Occupational Safety & Health

Precision — It is the degree of agreement between the data generated from repetitive measurements under specified conditions. It is generally reported as the standard deviation (SD) or relative standard deviation (RSD).

%D — Percent Difference.

Quality Assurance (QA)

It is a system of activities whose purpose is to provide the producer or user of a product with the assurance that the product meets a defined standard of quality. The system consists of two separate but related activities, quality control & quality assessment.

Quality Control (QC)

It is the overall system of activities whose purpose is to control the quality of a product so that it meets the needs of users.

Recovery Standards

They are selected compounds that are added to sample extracts immediately before instrumental analysis so that surrogate (internal standard) recoveries can be calculated.

RPD (%) Relative Percent Difference.

Relative Retention Factor (RRF)

It is the quotient of a target analyte response factor (instrument response per unit weight) divided by the response factor (RF) for its corresponding labelled surrogate. An RRF value remains constant over the range of concentration for which instrument response is linear.

RSD Relative Standard Deviation.

SDS Soxhlet/Dean-Stark extractor, an extraction device applied to the extraction of solid & semi-solid materials.

Spiked blank Laboratory control sample that has been fortified with native analytes of interest.

Stock Solution A solution containing an analyte that is prepared using a reference material traceable to EPA, the National Institute of Science & Technology (NIST), or a source that will attest to the purity & authenticity of the reference material.

Surrogate A compound whose composition and chemical properties are nearly identical to those of target analytes, but which is distinguishable from target analytes by some means of detection (i.e. MS). These include deuterated or ^{13}C-labelled analogues of the target analytes, which are added to the sample prior to extraction or clean-up steps.

Window Defining Mixture

It is a solution containing the earliest & latest eluting congeners within each homologous group of target analytes on a specified GC column.

SAMPLE DATA

ER-13

Lab Name	Maxxam Analytics Inc.				
Matrix (soil/water):	water			Lab Sample ID:	A203768-714490
Sample wt/vol:	990	(g/mL)	mL	Project Name:	JPL
Level (low/med)	low			Lab File ID:	KR0752
% Moisture	Not applicable	Decanted (Y/N):	N	Date Received:	February 8, 2002
Concentrated Extract Volume	1000	(uL)		Date Extracted:	February 11, 2002
Injection Volume	2	(uL)		Lab Batch:	20020211
Acid Wash Cleanup (Y/N):	N	pH	Not analyzed	Date Analyzed:	February 14, 2002
				Calib. Ref.:	20020214
				Time Analyzed:	18:52
				Dilution Factor:	1

CAS No.	Compound	Conc. (ug/L)	Qualifier	EDL (ug/L)	RL (ug/L)
62-75-9	NDMA	0.000800	J	0.000390	0.00200
	Surrogate	Recovery (%)	Acceptance Criteria (%)		
76523-40-5	D6-NDMA	16	10-85		

MW-4-2

Lab Name	Maxxam Analytics Inc.				
Matrix (soil/water):	water			Lab Sample ID:	A203768-714491
Sample wt/vol:	970	(g/mL)	mL	Project Name:	JPL
Level (low/med)	low			Lab File ID:	KR0753
				Date Received:	February 8, 2002
% Moisture	Not applicable	Decanted (Y/N):	N	Date Extracted:	February 11, 2002
Concentrated Extract Volume	1000	(uL)		Lab Batch:	20020211
				Date Analyzed:	February 14, 2002
Injection Volume	2	(uL)		Calib. Ref.:	20020214
				Time Analyzed:	19:04
Acid Wash Cleanup (Y/N):	N	pH	Not analyzed	Dilution Factor:	1

CAS No.	Compound	Conc. (ug/L)	Qualifier	EDL (ug/L)	RL (ug/L)
62-75-9	NDMA	0.00148	J	0.000390	0.00200
	Surrogate	Recovery (%)	Acceptance Criteria (%)		
76523-40-5	D6-NDMA	15	10-85		

Applied P & Ch Laboratory
13760 Magnolia Ave. Chino CA 91710
Tel: (909) 590-1828 Fax: (909) 590-1498

APCL Analytical Report

Submitted to:
SOTA Environmental
Attention: Yu Zeng
16835 W. Bernardo Dr, Ste. 212
San Diego CA 92127
Tel: (858)485-8100 Fax: (858)485-0812

Service ID #: 801-021400
Collected by:
Collected on: 01/29/02

Received: 01/29/02
Extracted: N/A
Tested: N/A
Reported: 02/27/02

Sample Description: Water
Project Description: 00HW019 JPL

Analysis of Water Samples

Component Analyzed	Method	Unit	PQL	Analysis Result MW-13 02-01400-1	MW-16 02-01400-2	MW-16D 02-01400-3
NITROSAMINES BY HRMS [a]						

PQL: Practical Quantitation Limit. MDL: Method Detection Limit. CRDL: Contract Required Detection Limit
N.D.: Not Detected or less than the practical quantitation limit. "-": Analysis is not required.
J: Reported between PQL and MDL.
Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0
[a] Subcontracted to Maxxam Analytics Inc. See attached.

Respectfully submitted,

Dominic Lau
Laboratory Director
Applied P & Ch Laboratory

Maxxam Analytics Inc

SUBMISSION CASE NARRATIVE
NDMA

MAXXAM L.I.M.S. No. A203024

PROJECT: Applied P & Ch Laboratory NDMA Analysis

I. Receipt

Samples were received at Maxxam on February 1, 2002.
Samples were received in good condition.

II. Holding Times

A. Sample preparation: all holding times were met.
B. Sample analysis: all holding times were met.

III. Method

The method followed was Maxxam's in-house method for NDMA analysis, Entitled "EXTRACTION & ANALYSIS OF NITROSAMINES AND NDMA BY HRMS" SOP # TO.1021.04.

IV. Preparation

Sample preparation proceeded normally. Samples were extracted on February 4, 2002.

V. Analysis

Analysis proceeded normally. Samples were analyzed on February 4, 2002.

A. Calibration: All criteria were met.

B. Mass Resolution: All criteria met.

50 Bathurst Drive, Unit 12, Waterloo, Ontario, Canada N2V 2C5 Tel: (519) 747-2575 Toll free (866) 747-8749 Fax: (519) 747-3806 Website: www.maxxam.ca

Maxxam Analytics Inc

C. Method Blank: All acceptance criteria were met for method blank.

D. Laboratory Control Spike: A LCS and LCSDUP were analyzed and they had a RPD of 7%.

E. Matrix spike/Matrix spike duplicate: MS and MSD were analyzed with these samples and they had a RPD of 1%.

F. Surrogate Standards: All samples and QC samples met surrogate Standard criteria

G. Samples: Sample analysis proceeded normally.

H. Glass blank: All acceptance criteria for the glass blank were met.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Maxxam Analytics Inc., both technically and for completeness, except for any conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the HRMS Facility Co-ordinator, as verified by the following signature.

AnnMarie Wright,B.Sc.
Laboratory Operations Manager

SUMMARY OF SAMPLES SUBMITTED-NDMA						
(YYYY/MM/DD)						
SOTA SAMPLE NO.	*MAXXAM*	*DATE*	*DATE*	*DATE*	*DATE*	*ASSOCIATED*
	L.I.M.S. ID	*SAMPLED*	*RECEIVED*	*EXTRACTED*	*ANALYZED*	*QC LABEL*
MW-13	A203024-709615	2002/01/29	2002/02/01	2002/02/04	2002/02/04	20020204
MW-13 MSD	A203024-709616	2002/01/29	2002/02/01	2002/02/04	2002/02/04	20020204
MW-13 MS	A203024-709617	2002/01/29	2002/02/01	2002/02/04	2002/02/04	20020204
MW-16	A203024-709618	2002/01/29	2002/02/01	2002/02/04	2002/02/04	20020204
MW-16D	A203024-709619	2002/01/29	2002/02/01	2002/02/04	2002/02/04	20020204

Glossary of Definitions

NDMA	N-Nitrosodimethylamine
OPR	Ongoing Performance & Recovery Standard (Matrix spike)
PAR	Performance & Recovery Standard (Spiking Mixture)
IPR	Initial Performance & Recovery Standard (Matrix spike)
K-D	Kuderna-Danish concentrator; a device used to concentrate the analytes in a solvent
LIMS	Laboratory Information Management System
MISA	Municipal Industrial Strategy for Abatement
EPA	see USEPA
USEPA	United States Environmental Protection Agency
CEPA	Canadian Environmental Protection Agency

amp	ampere
cm	centimetre
g	gram
h	hour
ID	internal diameter
OD	outside diameter
In.	inch
L	litre
M	Molecular ion
min	minute
mL	millilitre
mm	millimetre
m/z	mass-to-charge ratio
N	Normal; gram molecular weight of solute divided by hydrogen equivalent of solute, per litre of solution
mg	milligram 10^{-3}g
µg	microgram 10^{-6}g
ng	nanogram 10^{-9}g
pg	picogram 10^{-12}g
fg	femtogram 10^{-15}g
ppm	parts per million (mg/L, mg/kg)
ppb	parts per billion (µg/L, µg/kg)
ppt	parts per trillion (ng/L, ng/kg)
ppq	parts per quadrillion (pg/L, pg/kg)
v/v	volume per unit volume
w/v	weight per unit volume
DCM	Dichloromethane (Methylene Chloride)
PFK	Perfluorokerosene
HIRES	High Resolution
GC	Gas Chromatography

MS	Mass Spectrometry
HRMS	High Resolution Mass Spectrometry

Acceptance Criteria
: Values used by the laboratory in order to determine that a process is in control.

Accuracy
: It is the degree of agreement of a measured value with the true or expected value of the quantity of concern.

Analyte
: A Nitrosodimethylamine and/or 1,4-Dioxane parameter tested by a method.

Blind Sample
: It is a sample submitted for analysis whose composition is known to the submitter but unknown to the analyst. A blind sample is used to test the proficiency of a measurement process.

Calibration Standard (CAL)
: Consist of a set of solutions containing known amounts of native & carbon-13-labelled NDMA and/or 1,4-Dioxane. These solutions are used to establish the relationship between the parameter's concentration & MS detector response over the expected range of sample concentration.

Calibration Verification Material
: Consists of a calibration standard solution of intermediate level concentration (e.g. CS3), used to assess whether the initial calibration is still valid.

Certified Reference Material
: It is a stable, homogenous, and well characterized reference material, one or more of whose property values are certified by repetitive analysis by several operators & different methodologies in one or more qualified laboratories of known precision & accuracy. This material is used to assess the accuracy of a measurement process.

CAS#
: Chemical Abstracts Compound Registry Number.

Control Sample
: It is a reference material of known composition that is analyzed concurrently with test samples to evaluate the accuracy and/or precision of a measurement process.

EDL
: Estimated detection limit or detection limit.

Glassware Proof Rinse

It is the composite final solvent rinse of each piece of glassware intended for use in processing a batch of samples. Proof rinse samples are analyzed before sample processing begins.

Instrument Detection Limit

It is the smallest concentration/amount of analyte, in a solution containing only the analyte(s) of interest, which produces an instrumental response that satisfies all analyte detection & identification criteria.

IS — Internal Standard, a deuterated or ^{13}C-labelled analyte that is added to a sample extract prior to instrument analysis.

Isomer — A member of a group of compounds that differ from each other only in terms of locations of a specified number of common substituent atoms, or groups of atoms, on the parent compound.

Method Blank — Laboratory control sample using reagents, purified water, soil or relevant matrix known to be free of contaminants.

Method Detection Limit (MDL)

It is the smallest test sample concentration/amount of analyte that produces an instrumental response that satisfies all analyte detection & identification criteria when the sample is processed & analyzed according to the requirements of a specific test method. Reported MDL values reflect the composite effect of sample-related variables as well as method-related variables.

MSDS — Material Safety Data Sheet

NIOSH — National Institute of Occupational Safety & Health

Precision — It is the degree of agreement between the data generated from repetitive measurements under specified conditions. It is generally reported as the standard deviation (SD) or relative standard deviation (RSD).

%D — Percent Difference.

Quality Assurance (QA)

It is a system of activities whose purpose is to provide the producer or user of a product with the assurance that the product meets a defined standard of quality. The system consists of two separate but related activities, quality control & quality assessment.

Quality Control (QC)

It is the overall system of activities whose purpose is to control the quality of a product so that it meets the needs of users.

Recovery Standards

They are selected compounds that are added to sample extracts immediately before instrumental analysis so that surrogate (internal standard) recoveries can be calculated.

RPD (%) Relative Percent Difference.

Relative Retention Factor (RRF)

It is the quotient of a target analyte response factor (instrument response per unit weight) divided by the response factor (RF) for its corresponding labelled surrogate. An RRF value remains constant over the range of concentration for which instrument response is linear.

RSD Relative Standard Deviation.

SDS Soxhlet/Dean-Stark extractor, an extraction device applied to the extraction of solid & semi-solid materials.

Spiked blank Laboratory control sample that has been fortified with native analytes of interest.

Stock Solution A solution containing an analyte that is prepared using a reference material traceable to EPA, the National Institute of Science & Technology (NIST), or a source that will attest to the purity & authenticity of the reference material.

Surrogate A compound whose composition and chemical properties are nearly identical to those of target analytes, but which is distinguishable from target analytes by some means of detection (i.e. MS). These include deuterated or ^{13}C-labelled analogues of the target analytes, which are added to the sample prior to extraction or clean-up steps.

Window Defining Mixture

It is a solution containing the earliest & latest eluting congeners within each homologous group of target analytes on a specified GC column.

SAMPLE DATA

MW-13

Lab Name	Maxxam Analytics Inc.			Lab Sample ID:	A203024-709615
Matrix (soil/water):	water			Project Number:	1400
Sample wt/vol:	980	(g/mL)	mL	Project Name:	JPL
Level (low/med)	low			Lab File ID:	kr0444
% Moisture	Not applicable	Decanted (Y/N):	N	Date Received:	February 1, 2002
Concentrated Extract Volume	1000	(uL)		Date Extracted:	February 4, 2002
Injection Volume	2	(uL)		Lab Batch:	20020204
Acid Wash Cleanup (Y/N):	N	pH	Not analyzed	Date Analyzed:	February 4, 2002
				Calib. Ref.:	20020131
				Time Analyzed:	18:10
				Dilution Factor:	1

CAS No.	Compound	Conc. (ug/L)	Qualifier	EDL (ug/L)	RL (ug/L)
62-75-9	NDMA	0.00200	U	0.000390	0.00200
	Surrogate	Recovery (%)	Acceptance Criteria (%)		
76523-40-5	D6-NDMA	24	10-85		

MW-16

Lab Name	Maxxam Analytics Inc.				
Matrix (soil/water):	water			Lab Sample ID:	A203024-709618
Sample wt/vol:	1000	(g/mL)	mL	Project Number:	1400
Level (low/med)	low			Project Name:	JPL
				Lab File ID:	kr0447
% Moisture	Not applicable	Decanted (Y/N):	N	Date Received:	February 1, 2002
Concentrated Extract Volume	1000	(uL)		Date Extracted:	February 4, 2002
				Lab Batch:	20020204
Injection Volume	2	(uL)		Date Analyzed:	February 4, 2002
				Calib. Ref.:	20020131
				Time Analyzed:	18:47
Acid Wash Cleanup (Y/N):	N	pH	Not analyzed	Dilution Factor:	1

CAS No.	Compound	Conc. (ug/L)	Qualifier	EDL (ug/L)	RL (ug/L)
62-75-9	NDMA	0.00200	U	0.000390	0.00200
	Surrogate	Recovery (%)	Acceptance Criteria (%)		
76523-40-5	D6-NDMA	22	10-85		

MW-16D

Lab Name	Maxxam Analytics Inc.				
Matrix (soil/water):	water			Lab Sample ID:	A203024-709619
Sample wt/vol:	1010	(g/mL)	mL	Project Number:	1400
Level (low/med)	low			Project Name:	JPL
				Lab File ID:	kr0448
% Moisture	Not applicable	Decanted (Y/N):	N	Date Received:	February 1, 2002
Concentrated Extract Volume	1000	(uL)		Date Extracted:	February 4, 2002
				Lab Batch:	20020204
Injection Volume	2	(uL)		Date Analyzed:	February 4, 2002
				Calib. Ref.:	20020131
Acid Wash Cleanup (Y/N):	N	pH	Not analyzed	Time Analyzed:	18:58
				Dilution Factor:	1

CAS No.	Compound	Conc. (ug/L)	Qualifier	EDL (ug/L)	RL (ug/L)
62-75-9	NDMA	0.00200	U	0.000390	0.00200
	Surrogate	Recovery (%)	Acceptance Criteria (%)		
76523-40-5	D6-NDMA	20	10-85		

MW-13-MATRIX SPIKE DUPLICATE

Lab Name	Maxxam Analytics Inc.				
Matrix (soil/water):	water			Lab Sample ID:	A203024-709616
Sample wt/vol:	990	(g/mL)	mL	Project Number	1400
Level (low/med)	low			Project Name:	JPL
% Moisture	Not applicable	Decanted (Y/N):	N	Lab File ID:	kr0445
Concentrated Extract Volume	1000	(uL)		Date Received:	February 1, 2002
Injection Volume	2	(uL)		Date Extracted:	February 4, 2002
Acid Wash Cleanup (Y/N):	N	pH	NA	Lab Batch	20020204
				Date Analyzed:	February 4, 2002
				Calib. Ref.	20020131
				Time Analyzed:	18:22
				Dilution Factor:	1

CAS No.	Compound	MSD Extract Conc (ng/mL)	Extract Conc. (ng/mL)	Spike Level (ng/mL)	Recovery (%)	%RPD MS/MSD	Acceptance Criteria (%)
62-75-9	NDMA	3.92	0.00200	5.00	78	1	25

Internal Standard		Recovery (%)	Acceptance Criteria (%)
76523-40-5	D6-NDMA	24	10-85

MW-13-MATRIX SPIKE

Lab Name	Maxxam Analytics Inc.			Lab Sample ID:	A203024-709617
Matrix (soil/water):	water			Project Number	1400
Sample wt/vol:	1000	(g/mL)	mL	Project Name:	JPL
Level (low/med)	low			Lab File ID:	kr0446
% Moisture	Not applicable	Decanted (Y/N):	N	Date Received:	February 1, 2002
Concentrated Extract Volume	1000	(uL)		Date Extracted:	February 4, 2002
Injection Volume	2	(uL)		Lab Batch	20020204
Acid Wash Cleanup (Y/N):	N	pH	NA	Date Analyzed:	February 4, 2002
				Calib. Ref.	20020131
				Time Analyzed:	18:34
				Dilution Factor:	1

CAS No.	Compound	MS Extract Conc. (ng/mL)	Sample Conc. (ng/mL)	Spike Level (ng/mL)	Recovery (%)	Acceptance Criteria (%)
62-75-9	NDMA	3.97	0.00200	5.00	79	27-165

Surrogate		Recovery (%)	Acceptance Criteria (%)
76523-40-5	D6-NDMA	29	10-85

Applied P & Ch Laboratory
13760 Magnolia Ave. Chino CA 91710
Tel: (909) 590-1828 Fax: (909) 590-1498

APCL Analytical Report

Submitted to:
SOTA Environmental
Attention: Yu Zeng
16835 W. Bernardo Dr, Ste. 212
San Diego CA 92127
Tel: (858)485-8100 Fax: (858)485-0812

Service ID #: 801-021150
Collected by:
Collected on: 01/10/02

Received: 01/10/02
Extracted: N/A
Tested: N/A
Reported: 03/07/02

Sample Description: Water
Project Description: 00HW019 JPL

Analysis of Water Samples

Component Analyzed	Method	Unit	PQL	Analysis Result MW-17-3 02-01150-1
NITROSAMINES BY HRMS [a]				

PQL: Practical Quantitation Limit. MDL: Method Detection Limit. CRDL: Contract Required Detection Limit
N.D.: Not Detected or less than the practical quantitation limit. "-": Analysis is not required.
J: Reported between PQL and MDL.
† All results are reported on dry basis for soil samples.
Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0
[a] Subcontracted to Maxxam Analytics Inc. See attached.

Respectfully submitted,

Dominic Lau
Laboratory Director
Applied P & Ch Laboratory

Level D Data Package Deliverables

General Information

Project: 010HW019 JPL

APCL Service ID: 02-1150

Applied P & Ch Laboratory
13760 Magnolia Ave. Chino, CA 91710
Telephone (909)590-1828
Fax (909)590-1498

APCL

Applied P & Ch Laboratory

13760 Magnolia Ave. Chino CA 91710
Tel: (909) 590-1828 Fax: (909) 590-1498

Chain of Custody

Please Print in pen Page 2 of 2

Client: SOTA ENVIRTECH., INC. Contact: MIKE SAYRE Tel #: 858-485-8100 Fax #: 858-485-0812

Address: 16835 W. BERNARDO DR. #212 City: SAN DIEGO State: CA Zip code: 92127

Bill to: SOTA

Project Name/Code SPL Job # 00HW0019 P.O. #

Project Address PASADENA, CALIFONIA APCL Quotation #

Due Date: ☐regular ☐rush: ___ days ___ hours Sampled by: MES/JAT

Field Sample ID No.	Sample Description	Date Collected	Time Collected	Sample Matrix	Preservation	# of Containers
MW-17-1	MW-17-1	1/10/02	1555	WATER	—	1
ER-2	EQUIP. RINSATE		1425		HCl	3
					HNO_3	2
					—	1
MW-17-3	MW-17-3		1147		1	2

Analysis Items

VOCs (524.2)	Total Cr (200.8) & Pb	As (200.7)	Na, K, Ca, Mg, Fe (200.7)	Nitrate, Sulfate, Chloride (300.0)	Carbonate/Bicarb Alkalinity (310.1)	O-VII (7196)	Perchlorate (314.0)	TDS (160.1)	pH (150.1)	NDMA (1625C)
X	X	X	X	X	X	X	X	X	X	X
	X	X	X							
				X	X	X	X	X	X	X
										X

White – With report
Yellow – Lab copy
Pink – Originator

Remarks

1150

QC Requirement: ☐Regular; ☐QA/QC Report; ☐WIP; ☐Raw Data; ☐Extended Raw Data ☐CLP; ☐ACE ☐AFCEE ☐NEESA ___ (E, C or D); ☑Other _____ (Please specify)

Sample Disposal: ☐Return ☐Disposal by APCL ☐Hold for _____ days after receiving date. **If not specified, samples will be discarded 45 days after samples are received.**

Sample Conditions: ☐Intact; ☐Broken. Cooler Seal: ☐Intact; ☐Broken; ☐None. Tag # _____ Temperature: ☐Room ☐Cold (_____ °C).

Relinquished by [signature] Date/Time 1/10/02 1656 Received by [signature] Date/Time 01-10-02 1656

Relinquished by / Date/Time / Received by / Date/Time /

APCL USE ONLY Service # Note:

Applied P & Ch Laboratory
13760 Magnolia Ave., Chino CA 91710
Tel: (909) 590-1828 Fax: (909) 590-1828

1150

Sample Receiving Checklist

APCL ServiceID: _____ Client Name/Project: Sota Environmental

1. Sample Arrival

Date/Time Received 1/10/02 1656 Date/Time Opened 1/11/02 0832 By (name): Paul

Custody Transfer: ☐ Client ☐ Golden State ☐ UPS ☐ US Mail ☐ FedEx ☑ APCL Empl: Richard

2. Chain-of-Custody (CoC)

☑ With Samples? ☐ Faxed? ☑ Client has Copy? ☐ Signed, dated? By: _____
☑ Project ID? ☑ Analyses Clear? ☐ Hold Samples? #on Hold _____ # Received _____
☑ CoC/Docs Zip-Locked under lid? ☐ Compos.#: _ ☐ #Samples OK? _____
☐ Discrepancies? ☐ Client notified? ☐ Response (attach docs): _____

3. Shipping Container/Cooler

☑ Cooler Used? # of 1 Cooled by: ☑ Ice ☐ Blue Ice ☐ Dry Ice ☐ None
Temp °C 2.5 _____ _____ _____ _____ _____
(Cooler temperature measured from temp blank if present, otherwise measured from the cooler).
Cooler Custody Seal? ☐ Absent ☐ Intact ☐ Tampered?

4. Sample Preservation

☐ pH <2 ☐ pH >12
If Not, pH = _____ Preserved by: ☐ Client ☐ APCL ☐ Third Party _____

5. Holding-time Requirements

☐ pH 24hr ☐ BACT 6/24hr ☐ Cr^{VI} 24hr ☐ NO_3^- 48hr ☐ BOD 48hr
☐ Cl_2 ASAP ☐ Turbidity 48hr ☐ DO ASAP ☐ Fe(II) ASAP
☐ HT Expired? ☐ Client notified?

6. Sample Container Condition

☑ Intact? ☐ Broken? ☐ Documented? Number: _____
Type: ☑ plastic ☑ glass ☐ Tube: brass/SS ☐ Tedlar Bag
☑ Quantity OK? ☐ Leaking? ☐ Anomaly?
☑ Caps tight? ☐ Air Bubbles? ☐ Anomaly?
Labels: ☑ Unique ID? ☐ Date/Time ☐ Preserved?

7. Turn Around Time

☑ RUSH TAT: 5day ☐ Std (7-10 days) ☐ Not Marked

8. Sample Matrix

☐ Drinking H_2O ☑ Other Liq ☐ Soil ☐ Wipe ☐ Polymer ☐ Air ☐ Other: _____
☐ Ground H_2O ☐ Sludge ☐ Filter ☐ Oil/Petro ☐ Paint ☐ W. Water ☐ Extract ☐ Unknown

9. Pre-Login Check List Completed & OK?

☑ ALL OK? (if not, attach docs) ☐ Client Contact? (Name:_____)Date/Time:_____

Received/Checked by: Paul Date: 10 Jan 2002 Time: 8:42a.m.

*HT: Samples must be analyzed for results to reflect total concentrations. Results generated outside required of holding times are considered minimal values and may be used to define waste as hazardous but not as non-hazardous.

DocumentFile: [neal.texfiles]smprcl.tex.

59300

Applied P & Ch Laboratory
13760 Magnolia Ave. Chino CA 91710
Tel: (909) 590-1828 Fax: (909) 590-1498

Sample Login: Check List

02-01150 (1288_ 298) (4858100_ 298)

01/14/02

Part 1: General Information

☐	Company Information	Name:	*SOTA Environmental*
		Address:	*16835 W. Bernardo Dr, Ste. 212 ,San Diego ,CA 92127*
☐	Project Information	Project Description:	*JPL*
		Project #:	*00HW019*
☐	Billing Information	P.O. #:	
		Bill Address:	*16835 W. Bernardo Dr, Ste. 212 ,San Diego ,CA 92127*
		Lab Project ID:	*2002_0002*
		Client Database #:	*01*
☐	Receiving Information	Who Received Sample?	*Paul*
		Receiving Date/Time:	*01/10/02 1656*
		COC No.	
☐	Shipping Information	Shipping Company	*APCL pick up*
		Packing Information:	*Cooler/Ice Chester*
		Cooler Temperature:	*2.5 °C*
☐	Container Information	Container Provider:	*Client*
☐	Sampling Information	Sampling Person:	
		Sampling Company:	*Client*
☐	Turn-Around-Time Option:		*Rush 5 working day(s)*
☐	QC Option:		*NEESA C*
☐	Disposal Option:		*Not specify*

59301

Part 2: Sample Information

Seq. #	Sample ID (on COC)	Sample Sub-ID	APCL Sample ID	Matrix	Cont- tainer	Preser- vative	Vol, ml Am. g	# of Replica	Condition G, L, B	Collected mmddyy	Hold ?	Composite Group	TAT Days	
1	MW-17-3 / NDMA		02-01150-1	W	G		1000	2	G	011002	N	0	7	☐

Part 3: Analysis Information

Test Items: ☑ Customized-13, Sub-contract

Seq. #	Client"s Sample ID (as given on COC)	Sample Sub-ID	APCL Sample ID	Matrix	CUSTOM	
1	MW-17-3	NDMA	02-01150-1	W	X	☐

Login By En-Yu Paul Kou

Check By PK

59302

Nitrosamines by HRMS

Maxxam Analytics Inc

SUBMISSION CASE NARRATIVE
NDMA

MAXXAM L.I.M.S. No. A201163

PROJECT: Applied P & Ch Laboratory NDMA Analysis

I. Receipt

Sample was received at Maxxam on January 15, 2002.
Sample was received in good condition.

II. Holding Times

A. Sample preparation: all holding times were met.
B. Sample analysis: all holding times were met.

III. Method

The method followed was Maxxam's in-house method for NDMA analysis, Entitled "EXTRACTION & ANALYSIS OF NITROSAMINES AND NDMA BY HRMS" SOP # TO.1021.04.

IV. Preparation

Sample preparation proceeded normally. Sample was extracted on January 16, 2002.

V. Analysis

Analysis proceeded normally. Sample was analyzed on January 21, 2002.

A. Calibration: All criteria were met.

B. Mass Resolution: All criteria met.

Maxxam Analytics Inc

C. Method Blank: All acceptance criteria were met for method blank.

D. Laboratory Control Spike: A LCS and LCSDUP were analyzed and they had a RPD of 10%.

E. Matrix spike/Matrix spike duplicate: MS and MSD were not analyzed with this sample set.

F. Surrogate Standards: All samples and QC samples met surrogate Standard criteria

G. Samples: Sample analysis proceeded normally.

H. Glass blank: The surrogate recovery on the glass blank exceeds the control limits for water samples. This procedure does not expose the surrogate to any matrix other than the solvent.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Maxxam Analytics Inc., both technically and for completeness, except for any conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the HRMS Facility Co-ordinator, as verified by the following signature.

FOR

Patrick Pond
Senior Technical Specialist

SUMMARY OF SAMPLES SUBMITTED-NDMA

(YYYY/MM/DD)

SOTA SAMPLE NO.	*MAXXAM L.I.M.S. ID*	*DATE SAMPLED*	*DATE RECEIVED*	*DATE EXTRACTED*	*DATE ANALYZED*	*ASSOCIATED QC LABEL*
MW-17-3	A201163-698941	2002/01/10	2002/01/15	2002/01/16	2002/01/21	20020116

Glossary of Definitions

NDMA	N-Nitrosodimethylamine
OPR	Ongoing Performance & Recovery Standard (Matrix spike)
PAR	Performance & Recovery Standard (Spiking Mixture)
IPR	Initial Performance & Recovery Standard (Matrix spike)
K-D	Kuderna-Danish concentrator; a device used to concentrate the analytes in a solvent
LIMS	Laboratory Information Management System
MISA	Municipal Industrial Strategy for Abatement
EPA	see USEPA
USEPA	United States Environmental Protection Agency
CEPA	Canadian Environmental Protection Agency

amp	ampere
cm	centimetre
g	gram
h	hour
ID	internal diameter
OD	outside diameter
In.	inch
L	litre
M	Molecular ion
min	minute
mL	millilitre
mm	millimetre
m/z	mass-to-charge ratio
N	Normal; gram molecular weight of solute divided by hydrogen equivalent of solute, per litre of solution
mg	milligram 10^{-3}g
µg	microgram 10^{-6}g
ng	nanogram 10^{-9}g
pg	picogram 10^{-12}g
fg	femtogram 10^{-15}g
ppm	parts per million (mg/L, mg/kg)
ppb	parts per billion (µg/L, µg/kg)
ppt	parts per trillion (ng/L, ng/kg)
ppq	parts per quadrillion (pg/L, pg/kg)
v/v	volume per unit volume
w/v	weight per unit volume
DCM	Dichloromethane (Methylene Chloride)
PFK	Perfluorokerosene
HIRES	High Resolution
GC	Gas Chromatography

MS	Mass Spectrometry
HRMS	High Resolution Mass Spectrometry

Acceptance Criteria
: Values used by the laboratory in order to determine that a process is in control.

Accuracy
: It is the degree of agreement of a measured value with the true or expected value of the quantity of concern.

Analyte
: A Nitrosodimethylamine and/or 1,4-Dioxane parameter tested by a method.

Blind Sample
: It is a sample submitted for analysis whose composition is known to the submitter but unknown to the analyst. A blind sample is used to test the proficiency of a measurement process.

Calibration Standard (CAL)
: Consist of a set of solutions containing known amounts of native & carbon-13-labelled NDMA and/or 1,4-Dioxane. These solutions are used to establish the relationship between the parameter's concentration & MS detector response over the expected range of sample concentration.

Calibration Verification Material
: Consists of a calibration standard solution of intermediate level concentration (e.g. CS3), used to assess whether the initial calibration is still valid.

Certified Reference Material
: It is a stable, homogenous, and well characterized reference material, one or more of whose property values are certified by repetitive analysis by several operators & different methodologies in one or more qualified laboratories of known precision & accuracy. This material is used to assess the accuracy of a measurement process.

CAS#
: Chemical Abstracts Compound Registry Number.

Control Sample
: It is a reference material of known composition that is analyzed concurrently with test samples to evaluate the accuracy and/or precision of a measurement process.

EDL
: Estimated detection limit or detection limit.

Glassware Proof Rinse

It is the composite final solvent rinse of each piece of glassware intended for use in processing a batch of samples. Proof rinse samples are analyzed before sample processing begins.

Instrument Detection Limit

It is the smallest concentration/amount of analyte, in a solution containing only the analyte(s) of interest, which produces an instrumental response that satisfies all analyte detection & identification criteria.

IS — Internal Standard, a deuterated or ^{13}C-labelled analyte that is added to a sample extract prior to instrument analysis.

Isomer — A member of a group of compounds that differ from each other only in terms of locations of a specified number of common substituent atoms, or groups of atoms, on the parent compound.

Method Blank — Laboratory control sample using reagents, purified water, soil or relevant matrix known to be free of contaminants.

Method Detection Limit (MDL)

It is the smallest test sample concentration/amount of analyte that produces an instrumental response that satisfies all analyte detection & identification criteria when the sample is processed & analyzed according to the requirements of a specific test method. Reported MDL values reflect the composite effect of sample-related variables as well as method-related variables.

MSDS — Material Safety Data Sheet

NIOSH — National Institute of Occupational Safety & Health

Precision — It is the degree of agreement between the data generated from repetitive measurements under specified conditions. It is generally reported as the standard deviation (SD) or relative standard deviation (RSD).

%D — Percent Difference.

Quality Assurance (QA)

It is a system of activities whose purpose is to provide the producer or user of a product with the assurance that the product meets a defined standard of quality. The system consists of two separate but related activities, quality control & quality assessment.

Quality Control (QC)

It is the overall system of activities whose purpose is to control the quality of a product so that it meets the needs of users.

Recovery Standards

They are selected compounds that are added to sample extracts immediately before instrumental analysis so that surrogate (internal standard) recoveries can be calculated.

RPD (%) Relative Percent Difference.

Relative Retention Factor (RRF)

It is the quotient of a target analyte response factor (instrument response per unit weight) divided by the response factor (RF) for its corresponding labelled surrogate. An RRF value remains constant over the range of concentration for which instrument response is linear.

RSD Relative Standard Deviation.

SDS Soxhlet/Dean-Stark extractor, an extraction device applied to the extraction of solid & semi-solid materials.

Spiked blank Laboratory control sample that has been fortified with native analytes of interest.

Stock Solution A solution containing an analyte that is prepared using a reference material traceable to EPA, the National Institute of Science & Technology (NIST), or a source that will attest to the purity & authenticity of the reference material.

Surrogate A compound whose composition and chemical properties are nearly identical to those of target analytes, but which is distinguishable from target analytes by some means of detection (i.e. MS). These include deuterated or ^{13}C-labelled analogues of the target analytes, which are added to the sample prior to extraction or clean-up steps.

Window Defining Mixture

It is a solution containing the earliest & latest eluting congeners within each homologous group of target analytes on a specified GC column.

SAMPLE DATA

MW-17-3

Lab Name	Maxxam Analytics Inc.		
Matrix (soil/water):	water		
Sample wt/vol:	960	(g/mL)	mL
Level (low/med)	low		
% Moisture	Not applicable	Decanted (Y/N):	N
Concentrated Extract Volume	1000	(uL)	
Injection Volume	2	(uL)	
Acid Wash Cleanup (Y/N):	N	pH	Not analyzed

Lab Sample ID:	A201163-698941
Project Number:	1150
Project Name:	JPL
Lab File ID:	kr0136
Date Received:	January 15, 2002
Date Extracted:	January 16, 2002
Lab Batch:	20020116
Date Analyzed:	January 21, 2002
Calib. Ref.:	20020118
Time Analyzed:	13:38
Dilution Factor:	1

CAS No.	Compound	Conc. (ug/L)	Qualifier	EDL (ug/L)	RL (ug/L)
62-75-9	NDMA	0.00200	U	0.000390	0.00200
	Surrogate	Recovery (%)	Acceptance Criteria (%)		
76523-40-5	D6-NDMA	39	10-85		

Applied P & Ch Laboratory
13760 Magnolia Ave. Chino CA 91710
Tel: (909) 590-1828 Fax: (909) 590-1498

APCL Analytical Report

Submitted to:
SOTA Environmental
Attention: Yu Zeng
16835 W. Bernardo Dr, Ste. 212
San Diego CA 92127
Tel: (858)485-8100 Fax: (858)485-0812

Service ID #: 801-021338
Collected by:
Collected on: 01/24/02

Received: 01/24/02
Extracted: N/A
Tested: N/A
Reported: 02/27/02

Sample Description: Water
Project Description: 00HW019 JPL

Analysis of Water Samples

Component Analyzed	Method	Unit	PQL	Analysis Result MW-24-1 02-01338-1
NITROSAMINES BY HRMS [a]				

PQL: Practical Quantitation Limit. MDL: Method Detection Limit. CRDL: Contract Required Detection Limit
N.D.: Not Detected or less than the practical quantitation limit. "-": Analysis is not required.
J: Reported between PQL and MDL.
Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0
[a] Subcontracted to Maxxam Analytics Inc. See attached.

Respectfully submitted,

Dominic Lau
Laboratory Director
Applied P & Ch Laboratory

Maxxam Analytics Inc

SUBMISSION CASE NARRATIVE
NDMA

MAXXAM L.I.M.S. No. A202819

PROJECT: Applied P & Ch Laboratory NDMA Analysis

I. Receipt

Sample was received at Maxxam on January 30, 2002.
Sample was received in good condition.

II. Holding Times

A. Sample preparation: all holding times were met.
B. Sample analysis: all holding times were met.

III. Method

The method followed was Maxxam's in-house method for NDMA analysis, Entitled "EXTRACTION & ANALYSIS OF NITROSAMINES AND NDMA BY HRMS" SOP # TO.1021.04.

IV. Preparation

Sample preparation proceeded normally. Sample was extracted on January 31, 2002.

V. Analysis

Analysis proceeded normally. Sample was analyzed on February 4, 2002.

A. Calibration: All criteria were met.

B. Mass Resolution: All criteria met.

Maxxam Analytics Inc

C. Method Blank: All acceptance criteria were met for method blank.

D. Laboratory Control Spike: A LCS and LCSDUP were analyzed and they had a RPD of 7%.

E. Matrix spike/Matrix spike duplicate: MS and MSD were not analyzed with these samples.

F. Surrogate Standards: All samples and QC samples met surrogate Standard criteria

G. Samples: Sample analysis proceeded normally.

H. Glass blank: All acceptance criteria were met for the glass blank.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Maxxam Analytics Inc., both technically and for completeness, except for any conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the HRMS Facility Co-ordinator, as verified by the following signature.

AnnMarie Wright
Laboratory Operations Manager

SUMMARY OF SAMPLES SUBMITTED-NDMA						
(YYYY/MM/DD)						
SOTA SAMPLE NO.	*MAXXAM*	*DATE*	*DATE*	*DATE*	*DATE*	*ASSOCIATED*
	L.I.M.S. ID	*SAMPLED*	*RECEIVED*	*EXTRACTED*	*ANALYZED*	*QC LABEL*
MW-24-1	A202819-708292	2002/01/24	2002/01/30	2002/01/31	2002/02/04	20020131

Glossary of Definitions

NDMA	N-Nitrosodimethylamine
OPR	Ongoing Performance & Recovery Standard (Matrix spike)
PAR	Performance & Recovery Standard (Spiking Mixture)
IPR	Initial Performance & Recovery Standard (Matrix spike)
K-D	Kuderna-Danish concentrator; a device used to concentrate the analytes in a solvent
LIMS	Laboratory Information Management System
MISA	Municipal Industrial Strategy for Abatement
EPA	see USEPA
USEPA	United States Environmental Protection Agency
CEPA	Canadian Environmental Protection Agency
amp	ampere
cm	centimetre
g	gram
h	hour
ID	internal diameter
OD	outside diameter
In.	inch
L	litre
M	Molecular ion
min	minute
mL	mililitre
mm	millimetre
m/z	mass-to-charge ratio
N	Normal; gram molecular weight of solute divided by hydrogen equivalent of solute, per litre of solution
mg	milligram 10^{-3}g
µg	microgram 10^{-6}g
ng	nanogram 10^{-9}g
pg	picogram 10^{-12}g
fg	femtogram 10^{-15}g
ppm	parts per million (mg/L, mg/kg)
ppb	parts per billion (µg/L, µg/kg)
ppt	parts per trillion (ng/L, ng/kg)
ppq	parts per quadrillion (pg/L, pg/kg)
v/v	volume per unit volume
w/v	weight per unit volume
DCM	Dichloromethane (Methylene Chloride)
PFK	Perfluorokerosene
HIRES	High Resolution
GC	Gas Chromatography

MS	Mass Spectrometry
HRMS	High Resolution Mass Spectrometry

Acceptance Criteria
: Values used by the laboratory in order to determine that a process is in control.

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: It is the degree of agreement of a measured value with the true or expected value of the quantity of concern.

Analyte
: A Nitrosodimethylamine and/or 1,4-Dioxane parameter tested by a method.

Blind Sample
: It is a sample submitted for analysis whose composition is known to the submitter but unknown to the analyst. A blind sample is used to test the proficiency of a measurement process.

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: Consist of a set of solutions containing known amounts of native & carbon-13-labelled NDMA and/or 1,4-Dioxane. These solutions are used to establish the relationship between the parameter's concentration & MS detector response over the expected range of sample concentration.

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: Consists of a calibration standard solution of intermediate level concentration (e.g. CS3), used to assess whether the initial calibration is still valid.

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CAS#
: Chemical Abstracts Compound Registry Number.

Control Sample
: It is a reference material of known composition that is analyzed concurrently with test samples to evaluate the accuracy and/or precision of a measurement process.

EDL
: Estimated detection limit or detection limit.

Glassware Proof Rinse

It is the composite final solvent rinse of each piece of glassware intended for use in processing a batch of samples. Proof rinse samples are analyzed before sample processing begins.

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Isomer — A member of a group of compounds that differ from each other only in terms of locations of a specified number of common substituent atoms, or groups of atoms, on the parent compound.

Method Blank — Laboratory control sample using reagents, purified water, soil or relevant matrix known to be free of contaminants.

Method Detection Limit (MDL)

It is the smallest test sample concentration/amount of analyte that produces an instrumental response that satisfies all analyte detection & identification criteria when the sample is processed & analyzed according to the requirements of a specific test method. Reported MDL values reflect the composite effect of sample-related variables as well as method-related variables.

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NIOSH — National Institute of Occupational Safety & Health

Precision — It is the degree of agreement between the data generated from repetitive measurements under specified conditions. It is generally reported as the standard deviation (SD) or relative standard deviation (RSD).

%D — Percent Difference.

Quality Assurance (QA)

It is a system of activities whose purpose is to provide the producer or user of a product with the assurance that the product meets a defined standard of quality. The system consists of two separate but related activities, quality control & quality assessment.

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It is the overall system of activities whose purpose is to control the quality of a product so that it meets the needs of users.

Recovery Standards

They are selected compounds that are added to sample extracts immediately before instrumental analysis so that surrogate (internal standard) recoveries can be calculated.

RPD (%) Relative Percent Difference.

Relative Retention Factor (RRF)

It is the quotient of a target analyte response factor (instrument response per unit weight) divided by the response factor (RF) for its corresponding labelled surrogate. An RRF value remains constant over the range of concentration for which instrument response is linear.

RSD Relative Standard Deviation.

SDS Soxhlet/Dean-Stark extractor, an extraction device applied to the extraction of solid & semi-solid materials.

Spiked blank Laboratory control sample that has been fortified with native analytes of interest.

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Surrogate A compound whose composition and chemical properties are nearly identical to those of target analytes, but which is distinguishable from target analytes by some means of detection (i.e. MS). These include deuterated or ^{13}C-labelled analogues of the target analytes, which are added to the sample prior to extraction or clean-up steps.

Window Defining Mixture

It is a solution containing the earliest & latest eluting congeners within each homologous group of target analytes on a specified GC column.

SAMPLE DATA

MW-24-1

Lab Name	Maxxam Analytics Inc.		
Matrix (soil/water):	water		
Sample wt/vol:	970	(g/mL)	mL
Level (low/med)	low		
% Moisture	Not applicable	Decanted (Y/N):	N
Concentrated Extract Volume	1000	(uL)	
Injection Volume	2	(uL)	
Acid Wash Cleanup (Y/N):	N	pH	Not analyzed

Lab Sample ID:	A202819-708292
Project Number:	1338
Project Name:	JPL
Lab File ID:	kr0422
Date Received:	January 30, 2002
Date Extracted:	January 31, 2002
Lab Batch:	20020131
Date Analyzed:	February 4, 2002
Calib. Ref.:	20020131
Time Analyzed:	12:50
Dilution Factor:	1

CAS No.	Compound	Conc. (ug/L)	Qualifier	EDL (ug/L)	RL (ug/L)
62-75-9	NDMA	0.000910	J	0.000390	0.00200
	Surrogate	Recovery (%)	Acceptance Criteria (%)		
76523-40-5	D6-NDMA	24	10-85		

Applied P & Ch Laboratory
13760 Magnolia Ave. Chino CA 91710
Tel: (909) 590-1828 Fax: (909) 590-1498

APCL Analytical Report

Submitted to:
SOTA Environmental
Attention: Yu Zeng
16835 W. Bernardo Dr, Ste. 212
San Diego CA 92127
Tel: (858)485-8100 Fax: (858)485-0812

Service ID #: 801-021729
Collected by:
Collected on: 02/22/02

Received: 02/22/02
Extracted: N/A
Tested: N/A
Reported: 03/22/02

Sample Description: Water
Project Description: 00HW019 JPL

Analysis of Water Samples

Component Analyzed	Method	Unit	PQL	Analysis Result MW-7 02-01729-1
NITROSAMINES BY HRMS [a]				

PQL: Practical Quantitation Limit. MDL: Method Detection Limit. CRDL: Contract Required Detection Limit
N.D.: Not Detected or less than the practical quantitation limit. "-": Analysis is not required.
J: Reported between PQL and MDL.
† All results are reported on dry basis for soil samples.
Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0
[a] Subcontracted to Maxxam Analytics Inc. See attached.

Respectfully submitted,

Dominic Lau
Laboratory Director
Applied P & Ch Laboratory

Applied P & Ch Laboratory

APCL

13760 Magnolia Ave. Chino CA 91710
Tel: (909) 590-1828 Fax: (909) 590-1498

Chain of Custody

Please Print in pen Page 1 of 1

Client: SOTA ENVIR. TECH., INC. Contact: MIKE SAYER Tel #: 858-485-8100 Fax #: 858-485-0812

Address: 16835 W. BERNARDO DR. #212 City: SAN DIEGO State: CA Zip code: 92127

Bill to: SOTA

Project Name/Code JPL Job # COHW019 P.O. #

Project Address PASADENA, CALIFORNIA APCL Quotation #

Due Date: ☐regular ☐rush: ___ days ___ hours Sampled by: MES

Field Sample ID No.	Sample Description	Date Collected	Time Collected	Sample Matrix	Preservation	# of Containers
MW-7	MW-7	2/22/02	1147	WATER	HCl	3
					HNO_3	2
					—	6

Analysis Items: VOCs (524.2); Na, K, Ca, Mg, Fe (200.7); Total Cr & Pb (200.8); As (200.9); Nitrate, Sulfate, Chloride (300.0); Carbonate, Bicarb. Alk. (310.1); Perchlorate (314.0); Cr VI (7196); TDS (160.1); pH (150.1); 1,4 Dioxane (8270); NDMA (1625C)

White – With report
Yellow – Lab copy
Pink – Originator

Remarks

1729

QC Requirement: ☐Regular; ☐QA/QC Report; ☐WIP; ☐Raw Data; ☐Extended Raw Data ☐CLP; ☐ACE ☐AFCEE ☐NEESA ___ (E, C or D); ☐Other _____ (Please specify)

Sample Disposal: ☐Return ☐Disposal by APCL ☐Hold for _____ days after receiving date. **If not specified, samples will be discarded 45 days after samples are received.**

Sample Conditions: ☐Intact; ☐Broken. Cooler Seal: ☐Intact; ☐Broken; ☐None. Tag # _____ Temperature: ☐Room ☐Cold (_____ °C).

Relinquished by _____ Date/Time 2/22/02 1338 Received by _____ Date/Time 2/24/02 1338

Relinquished by _____ Date/Time / Received by _____ Date/Time /

APCL USE ONLY Service # Note: